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By-Broadbent, D.E.
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This paper begins with some main conclusions put forth by the author--(1) Very little has been published directly in the area of the psychology of language learning. (2) The very large amount of expertise and opinion-based activity among language teachers (which is based on assumptions about human behavior and which seems to work) would not come up to the scientific standards of a "purist psychologist," and (3) A large number of areas of general psychology are of relevance, but the full implications have not been worked out in the special situation of language learning. The author documents his first conclusion with three independent sources of bibliographical information. He discusses his other views on educational practices in language teaching, and presents brief descriptions of the various fields of investigation and different theoretical approaches in England and the United States. Studies of the role of meaning in learning languages, the optimum point of introduction of grammar, and the development of perceptual discrimination are suggested fields "worthy of further pursuit." (AMM)

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Notes on Current Knowledge concerning the Psychology of Learning Modern Languages *

By D. E. BROADBENT, D.Sc.,
Director Applied Psychology Research Unit, Cambridge.

1. GENERAL CONCLUSIONS AND OUTLINE OF THE PAPER.

This paper can hardly be called a review of literature, for reasons that will emerge. It rather represents a highly biassed selective personal point of view. and it is hoped merely that it will act as a basis for discussion. The main conclusions which I want to put forward are :—

(a) There is very little indeed that has been published directly in this area using the methods and criteria of academic psychology.

(b) There is a very large amount of expertise and opinion-based activity amongst language teachers, which is based on assumptions about human behaviour and which seems to work. It would not however come up to the scientific standards of a purist psychologist.

(c) There are a large number of areas of general psychology which are of relevance, but the full implications have not been worked out in the special situation of language learning.

The remained of the paper will attempt to give some justification for these conclusions : and it will be obvious from them why the paper does not take the form of a review of the literature. The items relevant to the first conclusion are too scanty to be reviewed, and those relevant to the second and third are far too numerous, especially since there is no clear frontier beyond which items would cease to be relevant. Consequently I have simply picked out certain developments which seem of significance and stated them bodly without attempting to document them. Finally, my own views about the areas which need further work are given.

2. ACADEMIC PSYCHOLOGICAL WORK ON FOREIGN LANGUAGE LEARNING.

The first of the above conclusions can perhaps be documented by giving three independent sources of bibliographic information.

(a) The Psychological Abstracts for 1960 to 1965 inclusive were searched for abstracts under the heading of language learning or foreign languages. Only 16 items appeared. It should be noted that the Psychological Abstracts for a period of this length include about 50,000 items, and are the most comprehensive collection of publications in the recognised psychological literature. Even allowing for problems of indexing, the most important point is therefore the small volume of publications.

The 16 items divided up as follows :—

6 items in Russian, varying from very general discussions to physiological measurements during reading of foreign languages : the common element, as often in

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Russian psychology, appears to be an emphasis on the activity of the person himself, and a disbelief in the view that perception is a simple arrival of information at a passive organism. This emphasis is doubtless justified.

2 general articles, not dissimilar from much of the non-psychological literature.

3 articles on aptitudes and attitudes of people before the process of instruction begins.

2 articles comparing visual and auditory methods.

3 articles on the forming of isolated pairs of associations between words (one of these in fact contains a theory of the child's acquisition of grammar, based on association between word classes and the order of events experienced, and it was answered in a very recent issue of the same journal by a transformationalist).

(b) A review of psycholinguistics in the Annual Review of Pschology for 1966, volume 17, by S. M. Ervin-Tripp and D. I. Slobin, covers the period from 1958 onwards. It gives 328 references on the psychology of speech, and the only information on language learning is the following sentence — "In view of the volume of verbal learning research, the lack of studies of second language acquisition is shocking".

(c) The British Council English Teaching Bibliography, in its original edition of 1961, might be expected to cover the major references under the heading of psychology up to that date. It does in fact include 44 references of a general psychological nature, no more connected with language learning than with any other branch of education : and only one reference under the heading of the psychology of language learning. This reference is to one of the Conferences on verbal learning and verbal behaviour organized by Dr. C. Cofer : it primarily concerns the formation of associations between isolated words. More recent supplements to the series include a few more references, but none of major importance and largely of the types already mentioned.

3. EDUCATIONAL PRACTICE IN TEACHING MODERN LANGUAGES

The paucity of publications in the orthodox psychological literature is accompanied by a very large amount indeed of activity amongst teachers in thinking up new methods and in trying them out. Any good bookshop will reveal a large collection of programmed texts, hints for teachers, etc., and it is neither practicable nor necessary to list the works falling into this category. In the majority of cases, the methods suggested are put forward either because of their intuitive appeal or as a result of practical experience : and there is no reason to doubt that many of the points made are sound. From the point of view of pure psychology, there is the embarrassment that a keen teacher may often get good results with a method for which he is enthusiastic, even though that method in itself possesses no special magic. There must always therefore be some doubt in the minds of the more cautious, but this can perhaps be balanced by a healthy respect for those who really teach people something.

Some common features do emerge as a general impression of the trend of this activity, and I do not think I can improve on the summary produced by Strevens in

Lowe & Lowe[1] (1965). Eight points which Strevens observes in the recent burst of activity in language teaching are as follows, rephrased in my own words.

(a) Teaching is intended to produce the ability to converse and/or correspond, rather than an abstract knowledge of "the language".

(b) Auditory presentation of the language is used early, combined with speech by the learner, and reading and writing come later.

(c) The materials used are specific to the particular circumstances of the course: that is, the kind of people who are learning, the size of the class, etc.

(d) The aspects of the language that are taught have been selected and restricted so that uncommon forms such as the past subjunctive may be omitted altogether from short courses. The various items are then staged and graded so that they are presented in the correct order.

(e) Language is taught in specific situations.

(f) Teaching is intensive rather than distributed.

(g) Audio and visual aids are used with increasing enthusiasm.

(h) Teaching of grammatical rules of formal statements about the language is avoided.

My own impression of the drift of opinion amongst language teachers confirms that these points are the dominant themes, and it is doubtful if they could be improved upon without something of the nature of a social survey amongst language teachers. They obviously imply assumptions about the psychology of learning languages, and I will return to these assumptions later. For the moment, it may be said that points (c) (d) and (g) fit in very well with the drift of psychological evidence in other areas: and so on the whole does (e), although there may possibly be some dangers in it. The other points do not necessarily fit well with existing psychological knowledge: they may well be true, but it is perhaps a little alarming that one can see reasons why they may be thought to be true without necessarily being universally applicable.

4 ACTIVITY AMONGST PSYCHOLOGISTS WHICH MAY BE OF RELEVANCE

In this area, the difficulty is to know what to include and what to exclude. From one point of view, all the traditional areas of psychology are relevant to the problems of language learning, and it is clearly hardly practical to sum up the entire subject. There is also the difficulty that one can classify the activities of psychologists either by the area in which they work, or by the approach which they use: the two classifications tend to be correlated, as different approaches tend to be suitable for different problems, but they are not identical. I propose therefore arbitrarily to list a number of areas in which research is going on, and then to give the four main approaches which are being used and which seem (purely to me) to be relevant.

(a) **Fields of investigation.**

(i) **Studies of the learning of associations between one speech-like symbol and another.** These are usually called studies in verbal learning, and occasionally vocabulary items in some foreign language and their English equivalents are used as the materials. There is a very large body of knowledge about the conditions making for forgetting, easy learning, and so on, in this particular situation. The area of experiment has grown up largely from attempts to account for

human and other behaviour as the outcome of a very large number of specific associations between individual items. Even where this theoretical approach has been discarded, the technique has continued to be used, in order to study questions such as the difference between short-term and long-term memory. In this country, work of this type is conducted in a number of places but on a relatively small scale. They include APRU Cambridge, University of Sheffield, and others. Some idication of the state of knowledge can be reached from Cofer[2] (1961).

(ii) **Studies of programmed learning.** Clearly any general points established about programmed learning should be applicable to the teaching of languages : and there is a great deal of research on programming. Much of the information discovered seems however to be specific to particular subjects taught, the findings general to all subjects mostly concerning the importance of staging and grading. A particularly interesting recent sub-area of work on programmed learning has however concerned the teaching of perceptual discriminations where comparisons have been made beween presentation of a sound with later information about its meaning, as contrasted with a warning about the meaning and subsequent presentation of the sound. According to many traditional approaches, the former method should be the better, but this does not seem to be supported by experiment. Research on programming goes on in Britain in Aberdeen, Sheffield, and at Birkbeck College London : work in the particular area of perceptual learning goes on at Hull. For a review of recent work, see part of an article by Smedslund[3] (1964).

(iii) **Studies of Meaning and Association.** There exists a good deal of information concerning the structure of word associations amongst people who are familiar with one language : and on the extent to which different adjectives tend to be applied in similar situations and are thus partially inter-changeable. Two aspects of this work are of especial importance for problems of language learning : firstly, that pre-existing associatiations may greatly affect the ease or difficulty of further learning, and that each fresh item presented from memory is almost certainly therefore assimilated into an existing structure. Secondly, studies made of bilinguals trained in defferent ways have produced a distinction between co-ordinate and compound bilinguals who possess separate and united meaning systems respectively. Some of the contemporary approaches produced by educationists appear to be aiming deliberately at the production of the co-ordinate type, while naturally occurring bilinguals are quite often of the compound type. It is not at all clear what the advantages are in each case. There is relatively little work on word associations in this country, although some is going on at Birkbeck College : semantic differential technique is used in Sheffield and at APRU Cambridge, but not for purposes connected with language learning. For the general area of word associations, see Deese[4] (1962) : for the semantic differential the original Osgood, Suci and Tannenbaum[5] (1957) and the later references given by Ervin-Tripp and Slobin[6] (1966). For studies of bilingualism, see Jakobovits and Lambert[7] (1961).

(iv) **Studies of the psychological reality of transformational grammar.** Experimental work in this area requires people to memorise or perform oper-

ations upon various sentences, and relates their success or failure to the grammatical structure of the sentences. For example, it has been claimed that the time taken to recognise the negative passive version of a sentence is the sum of the time taken to recognise the negative active and that to recognise the affirmative passive : while times taken for changes in the sentence which are not transformations are not additive in this way. Again, a number of memory experiments suggest that the efficiency of recall for the semantic items in a sentence is independent of that for recall of the particular transformation used in ot. Int his country, work of this type is carried out in Edinburgh. A general statement of the approach is given by Miller[8] (1962), and a more recent example is the work of Mehler and Miller[9] (1964).

(v) **Studies of children's acquisition of language.** A number of studies have recorded and analysed the utterances of children before the stage of perfect competence, and have attempted to classify the way in which the first language is acquired. Representative findings which are sometimes claimed are that adults address children in simple and grammatical utterances, that children tend to imitate the statements of the adult with omissions of, for example, function words, that the adult tends to imitate the child's condensed utterance with an expanded and grammatical statement, and that rules of structure appear to be acquired early and by a process of progressive differentiation : rather than by the gradual acquisition of a number of specific instances. That is, at early stages children may regularly use as noun phrases pairs of words of which the first belongs to one class and the second to another. Adults will regard some of the resulting combinations as grammatical, but others (two foot, a hands) as ungrammatical. I know of no work on this particular point in Britain, but there is a certain amount of study of child development, on which Professor B. Foss of the Institude of Education in London is probably the best authority, and some linguistic studies may be included. For examples of the approach, see Chapter 6 in Brown[10] (1965).

(vi) **Studies of the process of learning to discriminate complex patterns, especially of sound.** One well known line of attack here is the demonstration that the ability of a listener to hear the difference between two consonantal sounds depends upon the extent to which that difference represents two phonemic categories to him. This effect doubtless underlies the difficulty of language students in hearing differences in sounds which are important in the new language but which have no significance in the first language. This is often interpreted as the result of a beneficial effect upon perceptual discrimination from the ability to generate corresponding sounds oneself : a view which is also put forward however is that a discrimination acquired through one pair of responses may generalise to others, whether or not these responces imitate or generate the stimuli. Proponents of this alternative view point to similar effects in visual rather than auditory perception. I know of no sustained line of research in Britain on this topic, although there are occasional papers of some relevance to it, and there are studies of pattern discrimination from other points of view. For a brief outline of the effect see page 232 on Flanagan[11] 1965) : for example of the opposing point of view see Cross, Lane and Sheppard[12] (1965).

(b) **Different Theoretical Approaches.**

(i) Simple Stimulus-responce association. This approach concentrates primarily on problems in which the main difficulty is to find the exact conditions under which a specific stimulus can be made to produce a specific response from the man. It is associated largely with the name of B. F. Skinner, and is largely behind the enthusiasm for programmed learning. Its influence is clearly seen in the points made by Strevens, with their emphasis on teaching specific words and requiring the student to utter them rather than merely to think of them. It is precisely because this approach has achieved a good deal of solidly established success in abstract laboratory experiments that one is fairly happy about the fashionable opinions in language learning.

(ii) Mediated response associationism. This is the approach which attempts to explain observable behaviour through hypothesising the occurrence of internal events (mediating responses). Those events, even though now unobservable, can be traced back to historical origins in previously acquired observable responses. They form an internal structure which decides how any new information can be handled. Thus for example it is easy to learn to give word B in response to word A, if word A has previously been attached as a stimulus to word C, to which word B is a common associate. The fact that word C is an essential link in this process can be shown in various ways, and there is no question that the existence of such unobservable events is important in deciding ease of learning. This approach is associated at the present time perhaps chiefly with the mame of C. E. Osgood.

(iii) The transformationalist approach. It is harder to give a short summary of this attitude, since it is more recent than the others and is in any case of a different type, since it arises specifically from an interest in language. Essentially the point of view seems to be that the various symbolic structures used in transformational grammars correspond in some way to the events in the brain of the language user. In particular, a sharp distinction is made between specific words and the items which obey grammatical rules, so that this approach tends to play down the importance of experience of specific words. For an example of this attitude, see Bever, Fodor and Weksel[13] (1965).

(iv) The information processing approach. This attitude tends to regard biological systems, both animal and human, in terms of the various operations that are carried out on information between its entry to and departure from the nervous system. It has affinities with each of the previous approaches, since it allows for relatively mechanical sub-routines to run off common sequences of actions, for stored representations of the environment used to control behaviour in new situations, and for complex re-encodings (transformations) at various levels. It will also allow for certain other points which are not included in them, such as selective emphasis upon certain inputs; and it emphasises discrimination rather than assocation. It does not therefore concentrate on learning to give response X to stimulus A: but rather learning the set of responses X, Y and Z, the set of stimuli A, B and

C, and then forming a correspondence between the two sets. In general its main weakness is that is is not so much a theory as a language in which a large number of theories could be expressed. It does however exclude any approach which is not, at least in principle, capable of being programmed on a computer. A useful example of the approach is that of Miller, Galanter and Pribram[14] (1960) : as will have been realised from this rather sympathetic account, it is also the approach I would hold myself.

5 CONTEMPORARY PRACTICE IN LANGUAGE LEARNING IN THE LIGHT OF CONTEMPORARY PSYCHOLOGY.

From the foregoing section it will be almost self-evident why certain features of modern educational practice seem reasonable from the psychological point of view. Adopting the last of the four approaches mentioned in the last section, it will be clear that no amount of sophisticated calculation inside a computer will be adequate if the routines for reading in the information and printing it out are not present : in human terms these correspond to a repertoire of fairly low level abilities to discriminate patterns and to make muscular movements, which must be practised specifically, and which cannot be supposed to arise spontaneously from an abstract intellectual knowledge of the language. Hence the current emphases on involvement of the student, on presentation to him of actual auditory and visual stimulation, on careful selection of the specific material which he requires, all seem extremely reasonable. However, some of the points noted by Strevens as widely believed may well command less agreement among psychologists.

First, his point (b) concerning the early use of hearing and speech. The difficulty here is that some people for most of the time and most people for some of the time do better in laboratory experiments on learning with visual materials than with auditory materials. One can see that this may not necessarily apply in the case of second language learning, because the application to a particular spelling of pronounciation rules appropriate to the original language may produce something that is positively false : and it is a sound principle that it is harder to break an established bad habit than to learn correctly in the first place. One can well see therefore why teachers might avoid exposing their students to the temptation to distort the new language into the familiar categories of the old one. However, it is not absolutely clear that current practice may not have thrown out the baby of the usefulness of vision with the bath water of " negative transfer " from the spelling of the first language. The answer to training the sounds of the new language may be of a different kind, which still allows the use of vision at least for those individuals who prefer it.

Second, there is a marked conflict between the modern emphasis on intensive training, and classical psychological data on the relative effectiveness of massed and distributed practice. The conclusion of most of the experiments carried out in the associationist tradition has been that intentive learning may reach some particular criterion in a shorter total time but at the cost of a longer period actually spent in learning. That is, one hour of continuous practice may teach no more than five periods of ten minutes each at twenty-four hour intervals, but it does get you there on Monday instead of Saturday. More serious, the usual experimental finding is that the intensively learned material is rapidly forgotten : so that the hour spent on Monday may have been forgotten by

Wednesday. This laboratory finding may not be completely applicable in the practical case of language learning, because the person who has reached a certain criterion may then go and practise the language elsewhere rather than let it be forgotten through disuse; and he may well care more about learning it by the time he goes on his business trip than for spending as little time as possible actually in learning. Perhaps more important, it may be that it is only the aspect of learning studied in the experiments on association which behaves in this way, and that more complex features of language are indeed best learned intensively. The point is an open one, but on the face of it there is a conflict between current practice and the usual teachings of psychologists.

Third and most seriously, current practise does not seem to take conscious note of the role of previous experience in deciding what will be learnt in a new situation, and the extent to which the learning of a principle will transfer to a new situation. There is at least as much evidence from other fields that these processes are important in learning, as there is for the necessity of learning the basic perceptual and motor skills in a task. To take an analogy, it is necessary for a pilot to learn the fine muscular movements of flying an aircraft, and it is in general admitted that this can only be done in the actual situation. It is also useful however for him to understand the principles of aerodynamics so that he is not surprised to stall in a high speed turn, and it is essential for him to learn the principles of navigation rather than to be taught the way to each new city by practising specifically on that route. Returning to the case of language learning, the current fashions of teaching appear to be heavily influenced by the first of the psychological approaches mentioned, and to give relatively little attention to the possible value of the others.

It is interesting to compare these doubts with those expressed by Carroll[15] (1965): in his view, modern practice is doubtful from a psychological point of view, because psychologists hold that (1) learning is often of discrimination rather than association, (2) learning is assisted by the meaning of the material being learned in terms of previous learning, (3) vision is often better than hearing, (4) learning is facilitated by selective attention to critical features, (5) the more associations can be made between present material and that previously learned the better. The two sets of criticisms are not of course independent, as Carroll's points were read before the above was written, but they indicate a similarity of viewpoint.

6. GAPS IN EXISTING RESEARCH.

This section is clearly even less satisfactory than the others, because if I had clear and viable research ideas I would doubtless already be going at the work. However, the following points seem worth pursuit.

(a) **Studies of the role of meaning in learning languages.** The contrast has already been noted between the pressure of contemporary fashion to teach the new language as a separate skill complete in itself, and the traditional suggestion that assimilation to existing knowledge produces better learning. A profitable line of attack on this discrepancy might be through the pursuit of the distinction between co-ordinate and compound bilingualism made by Osgood and pursued by Jakoboite and Lambert (1961). Their findings need checking in any case because there may be quite peculiar features of French/English bilinguals in Canada, which might not apply in different social situations such as Welsh children, children of diplomatic parents in

London, and so on. In addition, their studies merely show consistent differences between the two kinds of bilingual, and it is not clear whether any particular advantage attaches to one rather than the other in the use of either language. The use of associations between one language and the other might also shed some light upon the way in which meaning is structured in the two types of person.

(b) **Studies of the optimum point of introduction of grammar.** As already indicated there is some psychological reason for thinking that the teaching of principles is sometimes economic and useful. It is also debatable whether principles are best taught through a set of specific but contrasting examples, or by means of some verbal rule stated in one language or the other. To think of ridiculous extremes, one might attempt to learn a complete vocabulary in a language before ever encountering a sentence : or one might conceivably practise a new grammar using familiar words before ever using the words of the new language. (Have you the foregoing sentence understood ?). Conclusive experimentation on the optimum balance between such extremes might be rather difficult in practice, if only because there may be no general answer. Nevertheless, it is a clear gap in knowledge even though experienced teachers may have some feel for it.

(c) **Studies of the development of perceptual discrimination.** At the level of the basic skills, articulation seems to have commanded more attention than perception : if only because of the view that perceptual discrimination is aided by imitation of the sounds which are being discriminated. In addition, the attempt is usually made to associate particular articulations with particular percepts, although as already indicated discrimination rather than association is an important aspect of learning. It is possible however that some benefit might be gained by attempting perceptual training on the basis of discrimination : and then relying on the trained perception to improve the articulation of the person concerned. If a man cannot hear the difference between his own performance and a model, he is unlikely to improve in attempting to imitate his instructor's voice. Furthermore, attempts at articulation on the part of the listener are hard to score and complicated from the point of view of class instruction. The kind of practical teaching device at which such fundamental work might be aimed would, for example, present correctly and incorrectly pronounced versions of a phrase in association with the written version, and ask the student to press one button if the sound is correct and the other if it is incorrect. By a suitable approximation of the incorrect to the correct, [illegible] of discrimination should be produced before the student actually attempts himself to make similar sounds. Other possible lines of attack on the basic skills might include the optimum length of utterance in practising articulation, the extent to which phonemes trained in one context can later be produced in another context, and so on.

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